Name: Date:

Polynomial Factoring solution (version 618)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 112}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-96}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-4 \pm 4\sqrt{6}\, i}{2}$$

$$x = -2 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 + 4i$ and $-7 - 5i$ in standard form $(a + bi)$.**

Solution

$$(-3 + 4i) \cdot (-7 - 5i)$$

$$21 + 15i - 28i - 20i^2$$

$$21 + 15i - 28i + 20$$

$$21 + 20 + 15i - 28i$$

$$41 - 13i$$

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3. **Write function $f(x) = x^3 + 12x^2 + 47x + 60$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	12	47	60
-5		-5	-35	-60
	1	7	12	0

$$f(x) = (x + 5)(x^2 + 7x + 12)$$

$$f(x) = (x + 5)(x + 3)(x + 4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 4) \cdot (x + 1)^2 \cdot (x - 2)^2 \cdot (x - 7)$$

Sketch a graph of polynomial $y = p(x)$.